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PATENT SPECIFICATION



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COMPLETE SPECIFICATION

Improvements in or relating to Refrigerator Cabinets

We, ELECTROLUX LIMITED, of Electrolux Works, Luton, Bedfordshire, a British Company (Assignees of PLATENMUNTERS REFRIGERATING SYSTEM AKTIEBOLAG, of 2, Norrmalmstorg, Stockholm, Sweden, a Swedish Company), do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to refrigerator cabinets which are cooled by means of refrigerating apparatus and which are built in recesses or the like formed in kitchen fittings or furniture.

It has been proposed in the Specification of Applicants' prior Patent No. 434,937 in connection with such built-in cabinets, to cool the refrigerating apparatus by means of air flowing by natural draft through a shaft enclosing the heat-delivering members of the apparatus. The cooling air normally enters the shaft at the bottom, passes underneath the cabinet then vertically upward along the rear face where it is heated by the heat-delivering members and finally passes along the top of the cabinet and out into the open air.

With such constructions it has been found by experience that the shaft for the cooling air had to be made relatively deep and that however deep the shaft was made it has not hitherto been possible with air-cooled absorption refrigerating apparatus of the inert gas type to obtain an evaporator temperature which allows ice to be frozen in a few hours at an air temperature of 38° C.

The object of the present invention is to provide a simple improvement in built-in cabinets which allows ice to be frozen readily by apparatus with a relatively narrow air shaft.

According to the present invention air guiding blades are arranged in the interior of the shaft for improving the air-flow through said shaft. Preferably the construction of refrigerator cabinet arranged within a recess so as to provide an outer air shaft having relatively angularly disposed portions and containing

the heat-delivering members of the apparatus includes the provision adjacent at least the upper junction of said portions of air guiding blades facilitating the change of direction of the air stream flowing through said shaft.

The provision of the said air guiding blades produces the surprising result with a cooling air temperature of 38° C. and without any increase of the depth of the shaft that the evaporator temperature drops by about 4° C.

The invention will be hereinafter more fully described with reference to the embodiments shown in the drawing by way of example. In all the embodiments the refrigerator cabinet is cooled by means of a refrigerating apparatus of the continuous cycle inert gas type, but it is to be understood that the invention is not limited to cabinets fitted with such type of apparatus, but may be applied to cabinets having other types of air-cooled refrigerating apparatus.

In the drawings:—

Fig. 1 shows a vertical longitudinal section through a built-in cabinet. Fig. 2 shows the arrangement of the guide blades. Fig. 3 shows a vertical longitudinal section through a built-in refrigerator cabinet having the guide blades arranged in another manner and louvre plates provided both at the lower and at the upper end of the air shaft. Fig. 4 shows the arrangement of the guide members in connection with a refrigerating apparatus arranged on the side wall of a refrigerator cabinet. Fig. 5 shows cooling ribs also constructed as guide plates.

As shown in the figures the actual refrigerator chamber 2 and the cold producer 3 arranged therein are thermally separated in known manner by means of heat insulation 4 from heat-delivering apparatus members arranged on the outer side 5 of the insulation and of which only the cooling fins 6 are visible. The heat-delivering apparatus members are provided with such fins for facilitating the transfer of heat. The outer wall 5 of the cooling chamber together with the members of

the refrigerating apparatus disposed thereon are located completely in a recess 7 which surrounds the same so that the front wall of the cabinet containing a cabinet door 8 and forming a part closure for the front opening of the recess lies substantially in the same plane as the front walls 10 of the recess.

The dimensions of the cabinet or recess are chosen so that between the cabinet walls 5 enclosing the insulation and the walls 7 of the recess there is formed a continuous air channel 11 which extends along the underface, the rear face and the upper face of the cabinet. Since heat is given up by the cooling fins 6 in the vertical part of the air channel to the air column located therein the said air column becomes lighter than the air outside the recess so as to produce an air flow due to natural draught in the direction of the arrows, the air passing over the heat delivering members of the apparatus.

In order to facilitate the setting up of a uniform cooling air-stream the front wall of the cabinet 9 is provided in known manner with air flow openings 13, 12 located above and below the cabinet door and constructed in the form of louvres. As shown by the arrows in Fig. 1 air is thus sucked in at the lower end between the inclined louvre plates 14 and in consequence of the heat taken up from the apparatus members to be cooled on the rear face of the cabinet then rises and leaves the upper air passage through the louvre plates 15 at the upper front wall of the cabinet in a uniform and constant stream.

The action and construction of the elements above-described together with the provision of supports 17 and spacers 18, 19 has been fully set out in the Specification of our prior Patent No. 434,937 hereinbefore referred to.

In order to facilitate the change of direction of air-flow due to the rectangular formation of the cabinet that is in order to reduce the velocity losses thus set up, separate guide blades are provided in accordance with the invention. The arrangement of the guide blades 22 is effected at one or more points where the air-stream has to change its direction as shown particularly in Fig. 2. The relative positions of the individual blades can be seen from Figs. 1 and 2. The guide blades are tightly supported between two carrier plates 20 and 21 their ends being connected rigidly with the respective carrier plates by spot welding, screws, rivets or the like. The guide blades 22 together with the carrier plates 20, 21 thus form a unitary guide mem-

ber which may be connected by screws, rivets or the like with the two spacers 19. The guide member can obviously be applied if desired during the construction of the refrigerator cabinet or when the latter is being fitted into the recess 7, so that in the latter case, releasable connection of the guide member allows the apparatus to be standardised and used in connection either with a "built-in" cabinet or with an isolated cabinet.

In Fig. 3 guide members of this nature are arranged at the upper and lower corners of the shaft 11. As can be seen from Fig. 3 the lower guide blades 25 are mounted at one side of the feet 17 which may be formed integrally with the runner-like spacers 18 by means of the carrier plate 24. The carrier plate on the other side may be rigidly secured to a downwardly projecting part of the refrigerating apparatus. The arrangement of two guiding members allows the velocity losses of the air-stream to be still further reduced. It is advisable to arrange the individual blades as is shown in Fig. 3 on a line which extends from the particular corner concerned of the recess towards the corresponding corner of the cabinet.

In the case of refrigerator cabinets which are cooled by means of a refrigerating apparatus arranged on the side wall thereof and having the cooling air shaft arranged laterally of the cabinet, the guide blades may be arranged as shown in Fig. 4. The individual guide blades 32 are here mounted between two bars 31 (only one of which is visible) and the unitary guiding member thus formed is secured to a suitable apparatus member of the refrigerating apparatus. This may be effected for example by welding the guide member to the condenser 30 or to a pressure equalizing vessel 33; usually provided in apparatus of the abovementioned type.

Instead of providing a separate carrier for the guide blades 32 the cooling fins of the condenser 30 especially with laterally arranged apparatus, may be utilised as guide members. As shown in Fig. 5 a number of cooling fins 37 corresponding to the desired number of guide blades are preferably made longer than the remainder of the fins 36 and are bent to the desired shape. If desired, the cooling fins of other heat-delivering members may be similarly shaped for the same purpose.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A built-in refrigerator cabinet cooled by means of a refrigerating apparatus having its heat delivering members disposed in a shaft for cooling air in which air guiding blades are arranged in the interior of the shaft for improving the air-flow through said shaft.
2. A refrigerating cabinet fitted with refrigerating apparatus and arranged within a recess so as to provide an outer air shaft having relatively angularly disposed portions and containing the heat-delivering members of the apparatus which includes adjacent at least the upper junction of said portions air guiding blades facilitating the change of direction of the air stream flowing through said shaft.
3. A built-in refrigerator cabinet according to Claim 1 or 2 and having the refrigerating apparatus arranged on the rear face of the cabinet in which the air guiding blades are arranged both at the upper and lower points where the cooling air-stream changes direction.
4. A built-in refrigerator cabinet according to Claim 1 and having the refrigerating apparatus arranged on a side wall of the cabinet in which the air guiding blades are arranged near the top of the air shaft.
5. A built-in refrigerator cabinet according to Claim 1 or 2 in which the air guiding blades are connected with the refrigerating apparatus in a readily releasable manner.
6. A built-in refrigerator cabinet according to Claim 5 and having its refrigerating apparatus provided with spacers determining the desired depth of the cooling air shaft in which the spacers are screwed to the refrigerating apparatus and the air guiding blades are welded to the spacers.
7. A built-in refrigerator cabinet according to any of Claims 1—4, in which the air guiding blades comprise a plurality of guide vanes connected mechanically with one another to form an element which can be inserted into the air shaft traversed by the cooling air.
8. A built-in refrigerator cabinet according to Claim 1 in which the air guiding blades consist of correspondingly formed cooling fins of the condenser or other heat-delivering member of the apparatus.
9. Air guiding members fitted to built-in refrigerator cabinets constructed and arranged substantially as described with reference to Figs. 1 and 2, Fig. 3, Fig. 4 or Fig. 5 respectively of the accompanying drawings.

Dated this 9th day of August, 1937.

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Fig.1

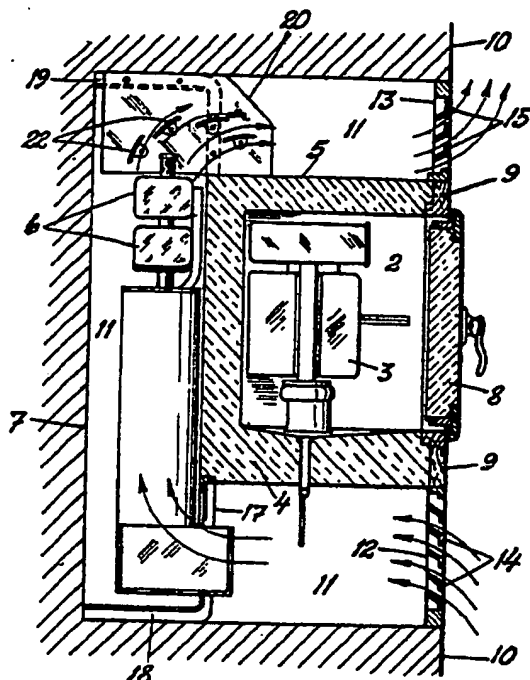
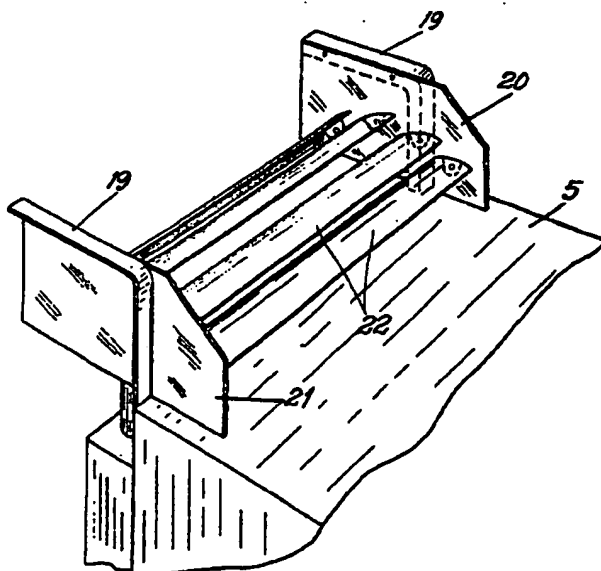
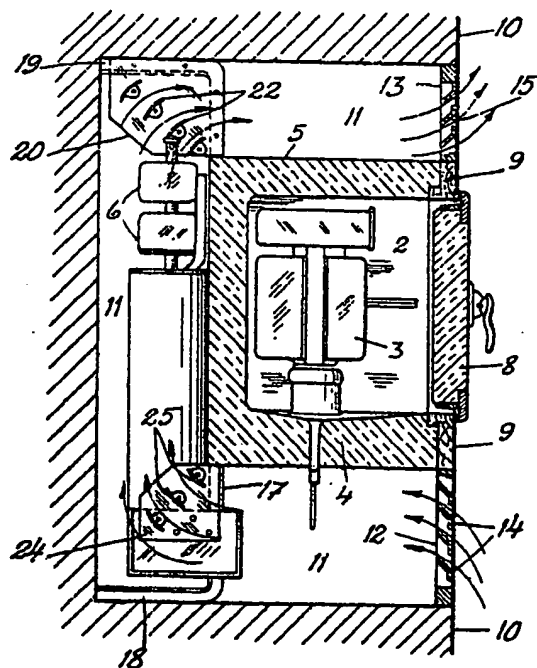
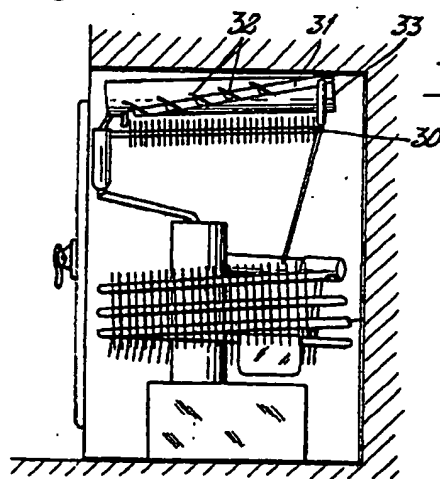
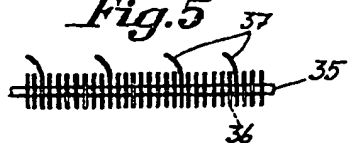
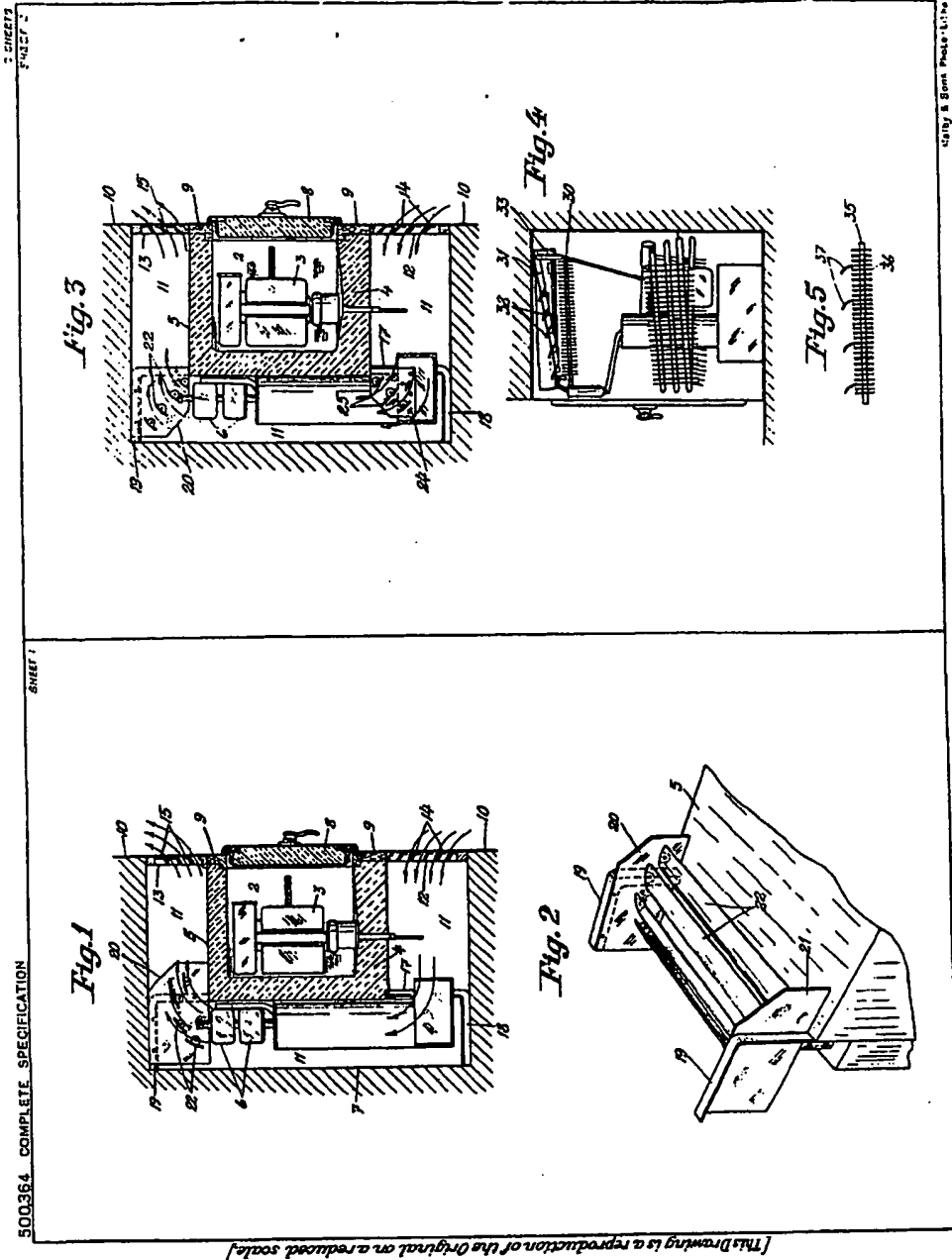


Fig. 2



[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 3*Fig. 4**Fig. 5*



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